



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/761,412

01/22/2004

Makoto Imanishi

2004-0092

3315

513 7590 08/08/2007
WENDEROTH, LIND & PONACK, L.L.P.
2033 K STREET N. W.
SUITE 800
WASHINGTON, DC 20006-1021

EXAMINER

ABOAGYE, MICHAEL

ART UNIT

PAPER NUMBER

1725

MAIL DATE

DELIVERY MODE

08/08/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/761,412	Applicant(s) IMANISHI ET AL.	
	Examiner Michael Aboagye	Art Unit 1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9-14 and 26-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-14 is/are rejected.
- 7) ☒ Claim(s) 26-32 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/719,768.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: The status of the Parent Application No. 09/719,768 should be updated as US 6,787,391. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-7, and 9-14 are rejected under 35 U.S.C. 103(a), as being unpatentable over AAPA (Applicant's Admitted Prior Art) in view of Inoue et al. (US Patent No. 5,984,165).

AAPA teaches a bump forming apparatus comprising: a bonding stage for supporting a semiconductor wafer and heating the semiconductor wafer to a temperature of forming bumps thereon; a bump forming head for forming the bumps on the electrodes of the semiconductor wafer; a load and transfer device for placing and removing the semiconductor wafer from said bonding stage; storage and holding members for wafer without bumps and wafer with bumps; a semiconductor wafer

Art Unit: 1725

composed of quartz or silicon (Background of applicants specification paragraph [0002]).

AAPA do not expressly teach a device for executing temperature controls.

However, Inoue et al. teaches a bump forming apparatus comprising; a heating device for preheating the bumping stage prior to bump formation, bump forming device and temperature controllers for both the preheating and post heating operations (column 5, lines 23-47 and column 8, lines 7-58); a temperatures measuring device linked to a feedback control loop (interpreted as programmed device)(column 3, lines 59-65 and column 8, lines 52-58); a heat shield (for thermal insulation (80), column 9, lines 1-7); an inert gas or nitrogen inlet/outlet (81) for purging the bonding stage and the bumps formed (column 9, lines 8-17). Inoue et al. further teaches heated air supply means for preheating the in bump unformed wafer (column 1, lines 27-40 and column 2, lines 39-42).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to have employed temperature controllers in the apparatus of AAPA as taught by Inoue et al. in order to perform the bumping process at a constant and stabilized temperature level and also to obtain a uniform and a reliably bumps on the semiconductor or wafer (Inoue et al., column 1, lines 55-57 and column 2, lines 50-53).

With respect to claims 1-7, and 9-14, the intended use of the instantly claimed apparatus is noted, however, the intended use does not patentably distinguish said claimed apparatus over the prior art. The intended use of the claimed does not structurally limit the apparatus. In addition, the prior art apparatus is capable of

Art Unit: 1725

performing the desired functions since AAPA teaches the structure adapted for said intended use.

Allowable Subject Matter

4. Claims 26-32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach a wafer temperature control device for controlling a temperature difference between a temperature at a bonding stage-contact face of the semiconductor wafer and a temperature at a circuit formation face of the semiconductor wafer opposite to the bonding stage-contact face before the bump formation is performed and after the semiconductor wafer is positioned on said bonding stage, said wafer temperature control device being operable to control the temperature difference to be within a warpage non-generation temperature difference range so that a warpage of the semiconductor wafer is restricted to a level not obstructing the bump formation.

Response to Arguments

5. Applicant's arguments filed March 21, 2007 have been fully considered but they are not persuasive. Regarding the applicant's argument that the Inoue reference does not disclose or suggest a controller for operating a bonding stage and a load and

Art Unit: 1725

transfer device so as to perform a post-heating operation on a semiconductor wafer. It is the examiner's position that these limitations which applicant is relies on to register his argument against Inoue reference have already being met by AAPA (see applicant's specification paragraphs [0002] and [0003]). The deficiency in AAPA upon which the Inoue reference was applied is rather drawn to a device for executing temperature controls. Inoue provides the remedy by teaching Inoue et al. teaching a bump forming apparatus comprising; a heating device for preheating the bumping stage prior to bump formation, bump forming device and temperature controllers for both the preheating and post heating operations (column 5, lines 23-47 and column 8, lines 7-58).

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Aboagye whose telephone number is 571-272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jonathan Johnson can be reached on 571-272-1177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1725

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



JONATHAN JOHNSON
PRIMARY EXAMINER



Michael Aboagye
Assistant Examiner
Art Unit 1725

08/04/2007

AM
AM